Specification

Printing Machine and Printing Machine System

The invention relates to printing presses, as well as a printing press system in accordance with the preambles of claim 1 or 4 or 11.

A drive mechanism for a printing group is known from EP 0 699 524 B1, wherein a drive motor axially directly drives a forme cylinder, which drives the remaining cylinders of the printing group. In exemplary embodiments with printing group cylinders which are mechanically coupled by means of a drive train, the drive motor which coaxially drives one of the cylinders is arranged on a lateral wall side I on the operating side, and the drive train on the side II of the printing group identified as drive side. In case of individual driving of all printing group cylinders by their own drive motors, these are arranged coaxially in respect to the respective cylinder, for example, on the side II, which is different from the lateral wall on the operating side.

DE 196 03 663 A1 discloses a drive mechanism of a forme cylinder by means of a drive motor via a pinion gear.

DE 40 12 396 A1 discloses a printing press system with two printing presses which can be individually driven independently of each other and are laterally spaced apart from each other. The printing units of one press can be driven together from a drive motor via respective shafts.

The object of the invention is based on producing printing presses, as well as a printing press system.

In accordance with the invention, the object is attained by means of the characteristics of claims 1 or 4 or 11.

A substantial advantage which can be obtained by means of the invention lies in that the outlay for planning, construction, manufacture and installation of a printing press, or a printing press system, can be lowered, specifically designed for the most varied demands of the customer, or of his available space. No special productions are required, which increase the outlay and tendency for breakdowns. The various printing presses, or printing press systems can be modularly produced from identical intermediate products. This is made possible by the orientation of the roll changer and/or the printing group in any desired way and/or by means of the symmetrical preparation of required connecting points.

Exemplary embodiments of the invention are represented in the drawings and will be described in greater detail in what follows.

Shown are in:

Fig. 1, a general view of a printing press,

Fig. 2, a schematic representation of webs of different widths,

Fig. 3, a schematic front view of a roll changer,

Fig. 4, a printing unit,

Fig. 5, an oblique plan view of a frame with main drive,

Fig. 6, a view from above on a frame of a printing unit,

Fig. 7, a representation of a drive train of the printing group cylinders,

Fig. 8, a schematic representation of the drive train to the inking system,

Fig. 9, a view from above on a first printing press system,

Fig. 10, a view from above on a second printing press system.

A printing press, in particular a web-fed rotary printing press, for imprinting one or several webs B has several units 100, 200, 300, 400, 500, 600, 700, 800, 900 for material supply 100, for imprinting and for further processing. For example, the web B to be imprinted, in particular a paper web B, is wound off a roll-unwinding device 100 before it is sent to one or several printing units 300 via a draw-in unit 200. It is possible to provide the printing units 300, which are routinely intended for multi-color printing (for example four units for four-color printing), with additional printing units 300, which in that case can be alternatingly employed with one or several of the remaining printing units 300 for flying printing forme changes, for example.

In an advantageous embodiment it is possible to provide a varnishing unit 400 in the web path.

Following imprinting, and possibly varnishing, the web B passes through a dryer 500 and, if required, is cooled again in a cooling unit 600 in case drying had been performed thermally. Downstream of the dryer 500, in or downstream of the cooling unit 600, it is possible to provide at least one further conditioning unit, not represented in Fig. 1, such as

a coating installation and/or a re-moistening device. Following cooling and/or conditioning, the web B can be conducted via a superstructure 700 to a folding apparatus 800. Not represented in Fig. 1, the superstructure 700 has at least a silicon unit, a longitudinal cutting device and a turning device, as well as a former unit. The mentioned silicon unit can also be arranged upstream of the superstructure 700, for example in the area of the cooling unit 600. The superstructure 700 furthermore can have, also not represented in Fig. 1, a perforating unit, a gluing unit, a numbering unit and/or a plow fold. After passing through the superstructure 700, the web B, or partial webs, are conducted into a folding apparatus 800.

In an advantageous embodiment the printing press additionally has a separate transverse cutter 900, for example a so-called open-sheet delivery unit, in which a web which, for example, had not been conducted through the folding apparatus 800, is cut into formatted sheets and, if desired, stacked or delivered.

The units 100, 200, 300, 400, 500, 600, 700, 800, 900 of the printing press have an effective width transversely in respect to the transport direction T of the web B, which permits processing of webs B of a maximum width b (Fig. 2) of up to 1,000 mm, for example. Here, effective width is to be understood as the respective width, or clear width, of the components directly or indirectly working together with the web B (for example rollers, cylinders, passages, sensor devices, actuating paths, etc.) of the units 100, 200, 300, 400, 500, 600, 700, 800, 900, so that the web B can be processed, conditioned and conveyed in its full width b.

Furthermore, the functionality (material supply, web transport, sensor devices, further processing) of the units 100, 200, 300, 400, 500, 600, 700, 800, 900 is designed in such a way that webs B' of only partial width down to a width b' of only 400 mm can be processed in the printing press.

The units 100, 200, 300, 400, 500, 600, 700, 800, 900, which define, or process, a section length a, have been designed in such a way that they define a section length a, for example between 540 and 700 mm, on the web B. The section length a advantageously lies between 540 and 630 mm. The section length a is around 620 ± 10 mm in a special embodiment. In a further development of the printing press, the units 100, 200, 300, 400, 500, 600, 700, 800, 900 have been designed in such a way that, with a few changes, the printing press can be selectively designed for section lengths of 546 mm, 578 mm, 590 mm or 620 mm. Thus, for example, substantially only an interchangeability of bearing elements for printing group cylinders (see below), a matching of the drive mechanism (see below), as well as a matching in the folding apparatus 800 (see below), or the transverse cutting device (see below) is required for the change in order to equip the same printing press for formats which differ from each other. For example, the section length a is routinely occupied by four vertical printed pages, for example DIN A4, side-by-side in the transverse direction of the web B, and two printed pages (for example of a length s) one behind the other in the longitudinal direction. However, depending on the printed image and subsequent further processing in the superstructure 700 and the folding

apparatus 800, other numbers of pages per section length a are possible.

The roll-unwinding device 100 can be embodied as a stationary roll changer with web storage or advantageously, as represented in Fig. 3, as a roll changer 100 for flying roll change. It has several, in this case two, pairs of support arms 101, 102, which are seated respectively aligned in pairs parallel in respect to the axis of rotation of a roll 104, 106 to be unwound and are individually movable. The separated, individually movable support arms 101, 102 make possible the simultaneous reception of rolls 104, 106 of different width b', b by the support arms 101 or 102 (Fig. 3). The axial movement occurs, for example, via drive motors 107 and/or via non-represented spindle drive mechanisms. The support 103 which, as a whole and as represented in Fig. 2, can be embodied in several parts, for example, is seated in a frame 109, or frame walls 109, mechanically pivotable around a center axis R103, which extends parallel in respect to the axes of rotation R104, R106, wherein the two pairs of support arms 101, 102 are seated, preferably offset from each other by 180° in respect to the center axis R103. Cones 111 receiving a roll core can be rotatorily driven, for example by means of a belt drive, by a drive motor 112 on a cone 111 per pair of support arms 101, 102. The respective other cone 111 is not driven.

For example, the axial positioning of the respective support arm 101, 102 is performed by a control and/or regulating device 114, only schematically indicated, by means of a reference value y-soll for the position of the roll 104,

106, or y-soll,i for the supports arms 101, 102 which. for example, has been manually preselected (for example from the operating console) or by a press control device. The reference values y-soll,i for the supports arms 101, 102 can also be formed in the control device 114 or in any other manner, for example from the reference value y-soll. For detecting the actual position y-ist of the respective support arm 101, 102, it is possible to assign a sensor device, not represented, to the drive mechanism and/or the support 103, which reports the position back to the control and/or regulating device 114. A sensor can be omitted if the actual axial position is correlated, for example via a rotor position etc., and is present as information. If the actual position y-ist (via the sensor device or the correlation) does not agree with the actual reference value y-soll, the control and/or regulating device 114 acts on the respective drive motors 107 by means of an actuating command Delta 107. A control process can be provided in an advantageous manner, in which the roll, freshly placed on the shaft, for example the roll 106, is automatically aligned in the axial direction in respect to the roll 104 (or web B, B'), which is just running out before the fresh web B, B' is glued to the running-out web B, B' by means of a gluing and cutting device 108, and the old web B, B' is cut off its roll 104, 106. By means of the driven support arms 101, 102 it is also possible and provided that, following the receipt of a fresh roll 104, 106, or prior to the start of production, the roll 104, 106 is automatically positioned in its axial position in regard to the desired path of the web edges, and the web edge is preset in this way. The control device of the roll changer

100 receives respective information regarding the planned production and/or preset values from the machine control device of the printing press.

In an advantageous embodiment the roll changer 100 is prepared for being serviced from both sides, i.e. the area of both frame walls 109. To this end, at least connecting locations (for example recesses, which can be covered, in the frame wall and/or openings, which can be covered, for signal lines) for receiving an operating element 116, for example a display 116 with appropriate input or switch elements, are provided at least in both frame walls 109 already in the course of their manufacture. Depending on the definition of a side I, the operating side I, provided in the course of setting up the press for its operation, in a first embodiment the recess in the opposite side II can be closed off by means of a cover, not represented, while the operating element 116 is installed on the side I intended for the operation of the press. In another embodiment, the roll changer has an operating element in principle in both frame walls 109 (side I and II).

Equipping with operating element 116 on both sides or selectively is of particular advantage within the scope of arranging the roll changer 100 in so-called left-right, as well as right-left presses, without it being required to provide individual solutions in regard to construction and manufacture. Left-right or right-left presses are here intended to be understood in such a way that this indicates the transport direction T of the web B, B' when the press is observed from that side, on which operating by the operators is intended, i.e. from the operating side I. Thus, in Fig. 1

this is a left-right press if it is assumed that the viewer is located on the side I. What has been said also applies in the same way to the below described printing units 300, draw-in elements, switchgear cabinets 361, as well as the linear traversing device 362, specially designed for this.

For multi-color imprinting of the web B, B', the printing press has several, for example at least four, here in particular five substantially identically equipped printing units 300. Preferably the printing units 300 are arranged side-by-side, and the web B, B' passes through them horizontally. Preferably the printing unit 300 is embodied for offset printing, in particular as a double printing group 300, or as an I-printing group 300 with two printing groups 301, for example two offset printing groups 301 for imprinting both sides in a so-called rubber-against-rubber operation. Rollers 302 are arranged upstream and downstream at least in the lower area, and optionally the upper area, of at least one of the printing units 300, by means of which an incoming web B, B' can be conducted around the printing unit 300 at the bottom or the top, a web B, B' which had been conducted around the upstream arranged printing unit 300 can be conducted through the printing unit 300, or the web B, B' conducted through the printing unit 300 can be conducted around the downstream located printing unit 300.

Fig. 4 schematically represents the arrangement of two printing groups 301 acting together via the web B, B', each with cylinders 303, 304 designed as a transfer cylinder 303 and as forme cylinder 304, also called printing group cylinders 303, 304, an inking unit 305 and a dampening unit 306. In an advantageous embodiment, the printing unit 300

has devices for semi- or fully automatic plate feeding 307, or the change of a printing forme 310, per forme cylinder 304.

In a further development, in particular if the printing press is intended to be suitable for imprint operations, at least one, or several printing units 300 have additional guide elements 308 close in front of and after the nip point of the printing unit 300. If a passage through a printing form 300 is to take place without imprinting and without contact between the web B, B' and the transfer cylinders 303, the web guidance indicated by dashed lines in Fig. 4, using the guide elements 308, is advantageous. The web B, B' passes through the nip point in such a way that it substantially forms an angle between 80° and 100°, for example approximately 90°, with a connection line of axes of rotation of the two transfer cylinders 303. The guide elements 308 are preferably designed as rods or rollers, around which air circulates. This reducsd thė danger of just freshly imprinted ink being rubbed off.

In a further development of the represented printing group 301, a washing device 309 is assigned to each transfer cylinder 303. The elastic surface of the transfer cylinder 303 can be cleaned by means of the washing device 309.

Each of the cylinders 303, 304 has a circumference between 540 and 700 mm, wherein the forme and transfer cylinders preferably have the same circumference. The circumferences advantageously lie between 540 and 630 mm. In a special embodiment, the section length a lies between 620 ± 10 mm. In a further development the printing unit 300 is designed in such a way that, with a few small changes, it is

possible to design it selectively with cylinders 303, 304 of a circumference of 546 mm, 578 mm, 590 mm or 620 mm. For example, merely an exchange of bearing elements, or a changed position of the bores in the lateral frame (and the boss; see below) in connection with the cylinders 303, 304 and matching of the drive mechanism (lever, see below), takes place.

The transfer cylinder 303 has at least one dressing, not represented, on its circumference, which is maintained in at least one groove extending axially on the shell face. Preferably the transfer cylinder 303 has only one dressing extending over the effective length, or substantially over the entire width of the web B, B' to be imprinted, and substantially (except for a joint, or a groove opening) over the entire circumference of the transfer cylinder 303. The dressing is preferably designed as a so-called metal printing blanket, which has an elastic layer (for example rubber) on a substantially dimensionally-stable support layer, for example a thin metal plate. The ends of this dressing are then introduced into the groove through an opening in the shell face and are held there positively or frictionally engaged. In case of a metal printing blanket, the ends are bent/beveled (for example, in the area of a leading edge by approximately 45°, and in the area of a trailing end by approximately 135°). These ends extend through an opening of a groove, which axially extends over the entire useful width of the transfer cylinder 303 and which, for example, also has an arresting, clamping or tensioning device. In the area of the shell face, the opening to the groove preferably has a width in the circumferential direction of the cylinder 304 of 1 to 5 mm, in particular less than or equal to 3 mm. The

clamping device is preferably made to be pneumatically actuable, for example in the form of one or several pneumatically movable levers which, in the closed state, are prestressed by means of a spring force against the trailing end in the groove. A hose which can be charged with a pressure medium can preferably be used as the actuating means.

Besides an ink supply device, for example an ink fountain 311 with an actuating device 312 for regulating the ink flow, the inking system 305 has a plurality of rollers 313 to 325. The ink supply device 311 can also be embodied as a doctor blade crosspiece. With the rollers 313 to 325 placed against each other, the ink moves from the ink fountain 311 via the ductor roller 313, the film roller 314 and a first inking roller 315 on a first distribution cylinder 316. Depending on the mode of operation of the inking system 306 (see below), the ink reaches at least one further distribution cylinder 321, 324 via at least one inking roller 317 to 320, and from there via at least one application roller 322, 323 the surface of the forme cylinder 304. In an advantageous embodiment, the ink moves from the first distribution cylinder 316 via different possible paths selectively or simultaneously (in series or parallel) via two further distribution cylinders 312, 324 to the application rollers 322, 323,325. In an advantageous embodiment of the inking and dampening system 305, 306, the second distribution cylinder 324 can simultaneously work together with a roller 328, for example the application roller 328 of the dampening system 306.

In a further development, the inking system 305 has, besides the rollers 313 to 325, at least one further roller 326, by means of which ink can be taken from the inking system 305 in the ink path, in particular upstream of the first distribution cylinder 316. This occurs in that an appropriate removal device 333 can be placed against the roller 326 itself or, as represented, a roller 327 working together with the latter (Fig. 4).

The roller 326 works together with a further roller 329 of the dampening system 306, for example a distribution roller 329, in particular a traversing chromium roller 329. The chromium roller 329 receives the dampening agent from a dampening installation, for example a roller 330, in particular a fountain roller 330, which dips into a dampening agent supply 332, for example a water fountain. A drip plate 335 for catching condensation water forming on the water fountain is preferably arranged underneath the water fountain and, in an advantageous embodiment, is embodied so that it can be heated, for example by means of heating spirals. A rotatory individual drive mechanism (not visible in Fig 5), in particular a drive motor, is provided for the distribution roller 329 and the fountain roller 330, and rotatorily and individually drives the respective rollers 329, 330 individually independently of each other via a corner or angular gear. The drive motor is preferably designed as an electric motor which is controllable (in particular continuously) in respect to the number of revolutions, in particular a rotary current motor. The setting of the numbers of revolution, or of the degree of dampening, can

advantageously take place from the control console, for example the ink control console, where they are also displayed. In a preferred embodiment, a correlation between the press speed and the degree of dampening, or number of revolutions, is stored in the press control device, by means of which the number of revolutions of the two rollers 329, 330, in particular that of the roller 330, can be preset.

In an advantageous embodiment the rollers 317, 318, 328 are arranged to be movable in the way indicated by solid and dashed lines. Movability of the rollers 317, 318, 328 should be understood here not to be the customary setting for adjusting purposes, but instead the operational movability for changing from one into another operating position. This means that actuating means which can be changed manually or by means of drive mechanisms, and/or detents (for example adjustable), are provided for one, as well as the other type of operation. Moreover, an increased permissible actuating path is provided, or the roller arrangement has been selected respectively in such a way, that the two positions can be achieved over the customary actuating path.

In an advantageous embodiment the chromium roller 329, as well as the roller 330, are each seated, for example in levers, movable in a direction perpendicular in respect to their axes, so that the position of the application roller 328 can be changed in the above mentioned way.

The distribution cylinders 316, 321, 324 of the inking system 305, as well as the roller 329 of the dampening system 306 are seated in lateral frames 352, 352, or frame walls 352, 353 (see Fig. 5), axially movable in such a way that they can perform a traversing movement. For the distribution

cylinders 316, 321, 324 and the roller 329, the traversing movement takes place in a forced manner, for example, by means of appropriate gears coupled with the respective rotatory drive. A seating which also permits traversing movements is also provided for the roller 328 and the application roller 323. In contrast to the first mentioned distribution cylinders 316, 321, 324 and the roller 329, the axial movement is only caused by means of friction between the cooperating shell faces, and not by means of an appropriate gear for traversing movements. Optionally it is also possible to provide such seating, which allows degrees of freedom in the axial direction, for the two application rollers 322 and 325.

The arrangement shown in solid lines in Fig. 4 in the inking and dampening system 305, 306 shows the interaction of the rollers 313 to 325 provided for "normal" printing operations. The inking and dampening agent paths are also in connection with each other, besides the forme cylinder 304. Besides direct, there is also indirect dampening.

By means of movability, or displaceability, of the roller 328, a choice is possible between direct dampening in the "three roller dampening system" and - as a function of the position of the roller 317 - indirect dampening, or direct dampening in the "five roller dampening system".

Each of the rollers 303, 304, and the rollers 313 to 330 of the inking and dampening systems 305, 306 is seated with their fronts in, or on, frame walls 352, 353. However, only the rollers 329 and 330, as well as the main drive 354 of the printing unit, also explained below, are represented by way of example in Fig. 5.

One of the frame wall 352, 353, in particular the one on the side of the main drive 354, is embodied in one or several pieces in such a way that it is possible to form a hollow space 356, which can be closed, for example a lubricant space 356, which extends at least over an area which covers the front of all cylinders 303, 304, and rollers or distribution cylinders which are in mechanical driving connection, in particular distribution cylinders 316, 321, 324 of the inking system 306. As schematically represented in Fig. 6, a releasable cover 356 for the hollow space 356 is provided at the front. The other frame wall 352 also forms a hollow space 359 by means of a releasable cover 358 arranged at the front, in which inter alia the switching and control devices 361 (in dashed lines) of the printing unit 300, for example in the form of a switchgear cabinet 361, are housed. In contrast to an arrangement between the printing units 300, the advantage arises by means of the arrangement at the front of the switching and control devices 361, that the space between two printing units 300 is accessible from both sides. Therefore an operating side I of the printing press is freely selectable in principle (see above, left-right press, right-left press). This is additionally aided in that a linear traversing device 362 connecting the printing units 300 can be selectively arranged at the frame wall 352 or 353 (Fig. 6; the linear traversing device 362 at the frame wall 352 is represented in dashed lines). Thus, the arrangement of this linear traversing device 362 defines the operating side I as the side located opposite the traversing device 362, and in the other way the arrangement of the traversing device 362 results from the selection of the operating side I.

Respective prepared connecting points 397 for the selective arrangement of the traversing device 362 are already provided in the course of manufacturing the frames 352, 353. For example, these can be designed in the manner of flanges with surface-treated areas (in contrast to rough cast material) and bores for attachments.

The same optionally applies to the preparation of a draw-in arrangement 399 (for example embodied as a draw-in guide device 399 for a draw-in means, not represented) through the printing unit 100. In this case, respective connecting points 398 (for example a finished surface with bore(s)) for receiving the draw-in guide device 399 can be prepared in both lateral frames 352, 353. Also, non-represented supply channels (energy, signal lines, operating means) between the printing units 300, or appropriate connecting points for them, can already be prepared in both lateral frames 352, 353. In this case these supply channels extend, for example, on the finally selected side II, preferably in the area of the linear traversing device 362.

As mentioned above in connection with the roll changer 100, it is possible in an advantageous manner to prepare, at least in each one of the frame walls 352, 353, a recess and/or a connection point (for example a recess in the frame wall, which can be covered, or openings for signal lines, which can be covered) for an operating element 390, for example a display 390, including appropriate input or switching elements, for example a touch-sensitive display.

It can be seen in Fig. 6 that the individual rotatory drives 364, 365 of the rollers 329, 330 are arranged on the side of the press opposite the main drive 354.

On the front side opposite the rotatory drive, the roller 329 has a traversing drive mechanism, not represented, in particular a gear for creating an axial traversing movement from the rotatory movement. Preferably this gear is arranged outside of the roller body in order to avoid the creation of spot heating in the roller 329. In an advantageous embodiment this gear is located on the drive side of the printing group 300, i.e. in the area of the same frame wall 353 as the main drive 354 and/or a drive train of the printing group cylinders 303, 304, but the rotatory drive mechanism of the rollers 329 and 330 on the opposite side, i.e. in the area of the frame wall 352. If the hollow space 356 is embodied as a lubricant space 356, the gear for creating the axial traversing movement can be arranged therein as an open, not specially lubricated gear. On the side remote from the gear for creating the axial traversing movement, the roller 329 is connected with the motor shaft of the drive motor 364, for example via an corner gear and an angle-compensating coupling and a coupling in such a way that a rotatory movement is transmitted, but an axial movement of the roller 329 in respect to the shaft is possible.

On the side facing the cylinders 303, 304, the frame walls 352, 353 each have a shoulder 363 protruding out of the straight line of the respective housing wall 352, 353. Advantageously the shoulder 363 is formed in one piece with the frame wall 352, 353 and is advantageously produced as a so-called boss 363 in the course of production in a casting mold. The boss 363 has bores extending through it and the straight line of the frame wall 352, 353 for receiving non-represented bearings. The boss 363 extends, in particular

continuously, over the front area of the forme and transfer cylinders 303, 305, but not over the front areas of traversing and/or traversable inking or dampening system rollers.

As can already be seen in Fig. 5, the driving of the cylinders 303, 304 of the printing unit 300 takes place by means of a main drive 354, for example an electric motor 354 fixed in place on the frame, in particular an electric motor 354 whose angle of rotation position can be regulated, which advantageously is designed to be water-cooled. Preferably driving is performed via a gear (for example gear wheel or belt gear) from the drive motor to at least one of the cylinders 303, 304.

In Fig. 7 the arrangement of the drive mechanism is represented, viewed from the frame wall 353 toward the outside. By means of its pinion gear 383 (dashed arrow), not visible in Fig. 7, the electric motor 354 does not drive a drive wheel 386, 387 of one of the cylinders 303, 304 directly, but via an intermediate wheel 384. The intermediate wheel 384 is seated in a lever 388, which is seated, pivotable in principle, around an axis of rotation R383 of the pinion gear 383. With a fixed position of the electric motor 354 in respect to the frame wall 353 of the frame, it is possible in connection with printing units 300 with different formats in a simple manner to make an adjustment to different cylinder circumferences (and therefore different circumferences of the drive wheels 386, 387). Depending on the format of the printing units 300, the lever 388 is pivoted in the course of assembly in such a way that the intermediate wheel 384 is in optimal engagement with

the respective drive wheel 386, 387. Fixation elements 389, for example bolts 389 and corresponding, non-represented bores (at the drive unit and/or the frame wall 353), are advantageously provided, by means of which, following assembly, the aligned lever 388 can be fixed in place in the appropriate position in respect to the frame wall 353 and/or the electric motor 354. Preferably the bores relevant to the respective format are already prepared in the course of manufacturing the components in the factory. In a printing unit 300, or printing press, for a first format (section length a), the lever 388 is fixed in a different angle position in respect to a vertical line than in a printing unit 300, or printing press, for a second format (section length a), while the electric motor 354 keeps its position in respect to the frame wall 353.

In a variation, the four printing group cylinders 303, 304 are driven in pairs (each via drive wheels 386, 387 of coupled forme and transfer cylinders 303, 304) by their own drive motors 354, for example again via a pivotable intermediate wheel 384. In principle a single, mechanically independent drive mechanism - with or without intermediate wheels 384 - of each printing group cylinder 303, 304 is possible.

Basically, driving can be performed from the intermediate wheel 384 - if provided - to any desired one of the drive wheels 386, 387. However, driving is preferably initially performed on the drive wheel 387 of one of the two forme cylinders 304. From there, driving takes place to the drive wheel 386 of the associated transfer cylinder 303, from there to the other transfer cylinder 303, and finally to the

second forme cylinder 304. The drive wheels 386, 387 are connected, fixed against relative rotation, with the respective cylinder 303, 304, for example by means of journals. Rotatory driving of one or several rollers 313 to 327 of the associated inking system 305 takes place via further drive wheels 391 connected, fixed against relative rotation, with the two forme cylinders 304. In an advantageous manner, the distribution cylinders 316, 321, 324 are rotatorily driven from the direction of the forme cylinder 304 via a positive drive connection, the ductor roller 313 has its own rotatory drive mechanism, for example its own, mechanically independent drive motor, not represented. The remaining rollers 314, 315, 317 to 320, 322, 323 and 325 to 327 of the inking system 305 are rotatorily driven only by friction (and, if required, axially, see above).

In an advantageous manner, driving is performed from the drive wheel 391 via an intermediate wheel 392 parallel to drive wheels 393, 394 of the two distribution cylinders 321, 324 (Fig. 8). Preferably the intermediate wheel is designed to be coupled in or out, so that the drive train and the forme cylinder 304 can be mechanically separated from each other. Driving is performed from the drive wheel 393 of the distribution cylinder 324 via a further intermediate wheel 395 to a drive wheel 396 of the distribution cylinder 316. Preferably the drive or intermediate wheels 392 to 396 are designed as gear wheels 392 to 396. The drive connections are embodied in such a way that an axial movement of the drive cylinders 316, 321, 324 is made possible.

As mentioned above, the design of a press in regard to the equipping of the units 100, 300 on both sides, or selectively on only one side in relation to the roll changer 100 (operating field 116) and/or the printing unit 300 (linear traversing device 362, connecting point 397, draw-in guide device 398, or connecting point 397 and/or operating element 390, or its connecting point) is of particular value in accordance with a first requirement, or design type, as a left-right press, and in accordance with a second requirement, or design type, as a right-left press. It is possible in the course of this to employ the same elements in each case, in particular with the substantially identical equipment characteristics. In this way a series construction and manufacture is possible.

Thus it is possible, for example, in a first embodiment, or a first type (in the top part of Fig. 9 represented by "Y"), to embody a printing press as a left-right press, wherein the rotatory drive motors 354 (rotatory drive mechanism, or drive side of the printing group cylinders 303, 304, merely indicated by (x) in Figs. 9 and 10), which are independent of each other, are arranged on the side II, i.e. the side facing away from the operating side I of the printing units 300. The traversing devices 362 and/or a possibly provided draw-in device 398, are also located on this side. In addition, at least one operating element 116 of the roll changer 100 and/or an operating element 390 of each printing unit 300 is also located at the lateral frame 352, 353 of the operating side I, which can also be defined

in this way. Here, the same elements can be used in the same embodiment.

If, for spatial or logistic circumstances of the print shop, a mentioned printing press should be designed in a second embodiment, or second type (in Fig. 9 represented at the bottom as "X") as a right-left press, the rotatory drive motors 354, which are independent of each other, are arranged on the side I, the operating side of the printing units 300. In addition, at least one operating element 116 of the role changer 100 and/or an operating element 390 of each printing unit 300 is located on the lateral frame 352, 353 of the operating side I. The traversing devices 362 and/or a possibly provided draw-in device 398, are located on the side II, i.e. the side of the printing units 300 facing away from the operating side I.

Thus, in connection with the two mentioned printing presses X, Y in Fig. 9, a differentiation is not made between the operating side I and the drive side, but in accordance with that side I, from which a space between the adjoining units, in particular the printing units 300, is accessible to the personnel (operating side I) or not, or is made difficult (side II). Depending on the type of the press, a drive side can then be located on the side I or the side II. In addition, the operating side I is preferably distinguished by the above mentioned arrangement of the operating elements 116, 390. The drive mechanisms, or drive sides, identified by (x) each have the drive motors 354, which are mechanically independent of other printing units 300, as well as advantageously the assigned, above described drive train

between the forme and transfer cylinders 304, 303 via the drive wheels 386, 387 - either only a forme and transfer cylinder 304, 303 in pairs per drive motor 354, or all four printing groups cylinders 303, 304 with a common drive motor 354 -.

The advantages of the two described types X, Y (Fig. 9, bottom and top) - in regard to the above mentioned equipment and arrangement - also become particularly useful within the framework of a printing press installation with several, for example two printing presses X, Y arranged in a print shop (having respectively at least one material supply device 100 and at least one associated printing unit 300). As shown in Fig.9, the two printing presses X, Y can preferably each be designed as complete presses, which therefore can be operated individually and independently of each other, i.e. both presses here have one or several units 400, 500, 600, 700, 800 (900 not represented) for further processing. However, in principle a web B, B' can be conducted from one press to the other for one or several further processing steps. This can be advantageous if one of the presses does not have one or several of the units 400, 500, 600, 700, 800 (900 not represented) for further processing or, if for reasons of production/the product, webs B, B', or partial webs from both presses are intended to be conducted on top of each other.

Fig. 9 (as a whole) represents two printing presses X, Y in a printing press installation, which are laterally spaced apart in respect to each other, i.e. the longitudinal axes (production direction) of the presses extend substantially parallel, but are spaced apart from each other to such an extent, that a space 1000 remains between the

presses which is accessible to the personnel for operating the presses. At least one operating console 1001 of the installation, for example a control console 1001, or several control consoles 1001, can preferably be arranged in this space 1000, from which the two presses can be operated.

One of the presses now has at least one printing unit 300 (in particular all associated printing units 300) with its drive motor 354 (or their drive motors 354) on the operating side I facing the space 1000, while the other press has at least one printing unit 300 (in particular all associated printing units 300) with its drive motor 354 (or their drive motors 354) on the operating side II facing away from the space 1000, or the operating side I. Regarding the arrangement of operating elements 116, 390, the draw-in device 398 and/or the traversing device 362, reference is made to what was said above.

Fig. 10 represents two printing presses X, Y in a printing press installation, which are spaced apart from each other in the longitudinal direction, i.e. the longitudinal axes (production direction) of the presses extend substantially parallel and are aligned. The space 1000, which can be accessed by the personnel for operating the presses, is located on the same side, the operating side I, of the two aligned presses and can preferably again have an operating console 1001.

Here, too, at least one of the presses has at least one printing unit 300 (in particular all associated printing units 300) with its drive motor 354 (or their drive motors 354) on the operating side I facing the space 1000, while the other press has at least one printing unit 300 (in particular

all associated printing units 300) with its drive motor 354 (or their drive motors 354) on the operating side II facing away from the space 1000, or the operating side I. Regarding the arrangement of operating elements 116, 390, the draw-in device 398 and/or the traversing device 362, reference is made to what was described above in connection with the left-right and right-left press, together with Fig. 9

In the arrangements in accordance with Figs. 9 and 10 the delivery 801 of the folded product by each of the two presses takes place in the direction toward the space 1000, or the side I, i.e. in one of the presses on the side having the drive motors 354 of this press, and in the other press on the side facing away from the drive motors 354 of the first press.

In a further development, the printing unit 300 has in its entry area, or in the area of its inlet nip between the two transfer cylinders 303, a device for affecting the fan-out effect 336, i.e. for influencing a change caused, for example by the printing process (in particular the moisture), in the transverse extension/width of the web B, B' from one printing location to another printing location. Preferably the device 336 is arranged in the entry area of a printing unit 300 which follows the first printing unit, i.e. after the web has already been imprinted at least once. It has at least an actuating member, for example a support member, by means of which the web B, B' can be deflected in a direction perpendicularly in respect to the web plane while being touched or, advantageously without contact. The actuating member is designed, for example, as a nozzle through which air can flow.

As indicated in Fig. 4 and already mentioned above, in an advantageous embodiment the printing group 301 has respectively the device 307 for the - at least partially automated - change of a printing forme 310, for example a flexible printing plate 301, on the assigned forme cylinder 304. The device 307 is designed in two parts and has a contact-pressure device 333, also called "semi-automatic changing device" 333, arranged in the area of a nip location between the forme and transfer cylinders 303, 304, and a magazine 334, structurally separated therefrom, with feeding and receiving devices for the printing formes 310.

List of Reference Symbols

100	Unit, material supply, roll unwinder
101	Support arm
102	Support arm
103	Support
104	Roll
105	-
106	Roll
107	Drive motor
108	Gluing and cutting device
109	Frame, frame wall
110	-
111	Cone
112	Drive motor
113	Compensating roller
114	Control and/or regulating device
115	-
116	Operating field, display
200	Unit, draw-in unit
300	Unit, printing unit, double-printing group, I-printing group
301	Printing group, offset printing group
302	Roller
303	Cylinder, transfer cylinder, printing group cylinder
304	Cylinder, forme cylinder, printing group cylinder
305	Inking system

306	Dampening system
307	Devices for semi- or fully automatic plate feeding
308	Guide element
309	Washing device
310	Printing forme, printing plate
311	Ink fountain
312	Actuating device
313	Roller, ductor roller
314	Roller, film roller
315	Roller, inking roller
316	Roller, distribution cylinder
317	Roller, inking roller
318	Roller, inking roller
319	Roller, inking roller
320	Roller, inking roller
321	Roller, distribution cylinder
322	Roller, application roller
323	Roller, application roller
324	Roller, distribution roller
325	Roller, application roller
326	Roller
327	Roller
328	Roller, application roller
329	Roller, distribution roller, chromium roller
330	Roller, fountain roller
331	-
332	Dampening agent supply

333	Pressing device, semi-automatic changing device
334	Magazine
335	Drip plate
336	Device for influencing the fan-out effect
337 to 351	-
352	Lateral frame, frame wall
353	Lateral frame, frame wall
354	Main drive, electric motor
355	-
356	Hollow space, lubricant space
357	Cover
358	Cover
359	Hollow space
360	-
361	Switching and control devices, switchgear cabinet
362	Linear traversing device
363	Shoulder, boss
364	Drive motor (329)
365	Drive motor (330)
366 to 382	-
383	Pinion gear
384	Intermediate wheel
385	-
386	Drive wheel
387	Drive wheel
388	Lever
389	Fixation element
390	Operating field, display

391	Drive wheel
392	Intermediate wheel, gear wheel
393	Drive wheel, gear wheel
394	Drive wheel, gear wheel
395	Intermediate wheel, gear wheel
396	Drive wheel, gear wheel
397	Connecting point (362)
398	Draw-in device, draw-in guide device
399	Connecting point (398)
400	Unit, varnishing unit
500	Unit, dryer
600	Unit, cooling unit
700	Unit, superstructure
800	Unit, folding apparatus
801	Delivery device
900	Unit, transverse cutter, open-sheet delivery unit
1000	Space
1001	Operating console, control console
a	Section length
s	Length
b	Width (B)
b'	Width (B')
B	Web, paper web
B'	Web, paper web
X	Printing press, type right-left

Y	Printing press, type left-right
T	Transport direction
R383	Axis of rotation